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March 18, 2002

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA COURIER

William F. Caton
Acting Secretary
Federal Communications Commission
236 Massachusetts Avenue, N.E., Suite 110
Washington, D.C. 20002

02-8

Re: Reply Comments, WT Docket No. 02-08, *Reallocation of the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*

Dear Mr. Caton:

Enclosed for filing please find an original plus four (4) copies of the Reply Comments of ArrayComm, Inc. in the above-captioned docket. Also enclosed please find one copy of the Comments marked "Stamp In." Kindly date-stamp this document and return it to me in the enclosed self-addressed envelope.

Please do not hesitate to contact me with any questions or concerns regarding this filing: 202.955.9890.

Sincerely,

Stephanie A. Joyce
Associate
Counsel for ArrayComm, Inc.

Enclosures

No. of Copies rec'd 0+5
List A B C D E

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	WT Docket No. 02-08
Reallocation of the 216-220 MHz,	)	RM-9267
1390-1395 MHz, 1427-1429 MHz,	)	RM-9692
1429-1432 MHz, 1432-1435 MHz,	)	RM-9797
1670-1675 MHz, and 2385-2390 MHz	)	RM-9854
Government Transfer Bands	)	RM-9882

To: The Commission

REPLY COMMENTS OF ARRAYCOMM, INC.

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Date: March 18, 2002

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SUMMARY

The record in this proceeding supports, or, due to the paucity of comment on some issues, does not oppose, each of ArrayComm's positions regarding the Commission's proposed rules for the 1670-1675 MHz band. ArrayComm's requests for nationwide licensing and application of Part 27 rules were echoed by fellow commenters, as was its support for flexible regulation that would permit both CMRS and PMRS services over this band. In addition, ArrayComm was joined by InsideTrax in calling for the licensing of this band in its full 5 MHz block, a request that has consistently produced unanimity among potential license applicants. Conversely, no party supported the Commission's consideration of band managers for this spectrum, while ArrayComm has shown that band managers would provide no advantage for the efficient use of the 1670-1675 MHz band. ArrayComm has also provided positive comment on the Commission's proposal to forbear from applying Title II regulations to this band, and has argued that this band warrants even further forbearance than the Commission has previously adopted for wireless voice communications.

The record also supports adoption of 10-year license terms, with renewal contingent upon a showing of "substantial service." A competing proposal for 20-year license terms, offered by AeroAstro, has no basis in sound policy and should be rejected. Similarly, AeroAstro's proposal to amend the standard governing "substantial service" provides no assurance of the efficient use, or indeed any use, of the 1670-1675 MHz band and should be rejected as contrary to the public interest.

The presence of co-channel, co-primary meteorological satellite operations and adjacent-band radioastronomy and radiosonde operations poses unique protection challenges for this band. These operations are conducted at a limited number of locations, however, many of which are remote. By identifying the specific sites requiring protection and defining protection criteria that

apply only at those sites, the Commission can meet the dual objectives of protecting these critical operations and of maximizing the commercial value of the 1670-1675 MHz band. A lack of well-defined protection criteria, on the other hand, presents significant commercial risk for licensees. This risk could severely diminish the value of the spectrum, thereby hindering the success of the upcoming auction.

The alternative approach of constraining in-band operations in an attempt to indirectly control out-of-band emissions needlessly limits the commercial utility of the band and in fact may reduce the level of protection afforded to other users. In-band emissions and operations rules should instead be crafted to maximize the spectrum's utility. Licensees should be responsible for determining how best to exploit those in-band prerogatives while they provide the mandated protection to other services.

Finally, the Commission's proposed two-tiered bidding structure was not opposed in this proceeding. The additional public safety bidding credit advanced by InsideTrax, however, was strongly questioned by ArrayComm as to whether it comports with Section 309 of the Communications Act of 1934 or with the Commission's competitive bidding policy. Its necessity for ensuring adequate auction participation is similarly dubious. Were the Commission to create such a bidding credit, its application must be made sufficiently broad such that any carrier that will serve public safety is eligible for the credit. Absent such broad application, the Commission would prejudice auction participants in a manner contrary to Congress's intent and the public interest generally.

ArrayComm looks forward to participating in the upcoming auction and to providing its innovative *i-BURST*™ services to the American public. It is encouraged by the Commission's efficiency in conducting this proceeding and urges the Commission to maintain this pace when

deciding the rules that will govern the 1670-1675 MHz band. As there is no opposition in the record to the reallocation of this spectrum, nor any significant controversy regarding the proposed rules, the Commission should proceed to auction with all due speed in order that this spectrum may support valuable services as soon as possible.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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	)	WT Docket No. 02-08
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Government Transfer Bands	)	RM-9882

To: The Commission

REPLY COMMENTS OF ARRAYCOMM, INC.

ArrayComm, Inc. ("ArrayComm"), by its attorneys, hereby submits these Reply Comments in response to the Notice of Proposed Rulemaking ("*Reallocation NPRM*")[1] released by the Federal Communications Commission ("FCC" or "Commission") in the above-captioned docket regarding the licensing, service and technical rules to apply to recently reallocated spectrum.[2] In further support of the proposals set forth in its Comments filed on March 4, 2002, and in an effort to assist the Commission in adopting rules that will speed this spectrum to auction, ArrayComm respectfully states the following:

I. The Record Amply Supports Adoption of the Commission's Proposed Licensing Plan for the 1670-1675 MHz Band

The Commission's proposed licensing plan is well supported in this record. Commenters unanimously support application of Part 27 service and technical rules to the 1670-1675 MHz

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[1] *Reallocation of the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, WT Docket No. 02-08, Notice of Proposed Rulemaking, FCC 02-15 (rel. Feb. 6, 2002), published at 67 FR 7113 (Feb. 15, 2002).

[2] *Reallocation of the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, ET Docket No. 00-221, RM-9267, RM-9692, RM-9797, RM-9854, Report and Order and Memorandum Opinion and Order, FCC 01-382 (rel. Jan. 2, 2002).

band.[3] In addition, all potential applicants for this band strongly urge the Commission to grant licenses on a nationwide basis in a complete 5 MHz block. Finally, nothing in the record indicates that band managers would provide any advantage to either the licensing or the provision of service in the 1670-1675 MHz band. Although that construct may be appropriate for other bands, the Commission has no reason to believe that band managers will be any more efficient in speeding service to end users than are the three companies that will compete directly for use of this spectrum.

A. Commenters Overwhelmingly Support Application of Part 27 Rules to the 1670-1675 MHz Band

All parties commenting on the proposed regulatory regime for this band agree that application of the Commission's Part 27 is the correct approach.[4] As ArrayComm explained in its Comments, Part 27 rules provide the "most efficient, most expeditious" use of spectrum[5] in keeping with Congress's goals in Section 303 of the Act.[6] In addition, InsideTrax (formerly MicroTrax) states that these rules "would provide an appropriate amount of flexibility to licensees in that the technology-neutral approach of the Wireless Communications Services rules provides the opportunity for a range of new and innovative technologies to use the reallocated spectrum."[7] AeroAstro agrees with this approach, arguing that application of Part 27 "will encourage use of the band for the services of greatest value to society[.]"[8]

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3 *Reallocation NPRM* ¶¶ 16-18.

4 WT Docket No. 02-08, Comments of ArrayComm, Inc. at 4-5 (March 4, 2002) ("ArrayComm WT 02-08 Comments"); Comments of InsideTrax at 5 (March 4, 2002) ("InsideTrax WT 02-08 Comments"); Comments of AeroAstro, Inc. at 4-5 (March 4, 2002) ("AeroAstro WT 02-08 Comments").

5 ArrayComm WT 02-08 Comments at 5.

6 47 U.S.C. § 303, as amended by the Omnibus Consolidated Appropriations Act, Pub. L. No. 104-228, 110 Stat. 3009 (1996).

7 InsideTrax WT 02-08 Comments at 5.

8 AeroAstro WT 02-08 Comments at 5.

The Commission should therefore adopt its tentative proposal to use Part 27, rather than Part 101, rules for regulating the services and technologies used in the 1670-1675 MHz band. This approach provides a necessary balance of Commission oversight and carrier flexibility that will best further Congress's goals of efficient use of the public radio spectrum.[9]

B. The Record Demonstrates that Grant of Nationwide Licenses As a 5 MHz Block Is Crucial for the Financial Viability of Services in the 1670-1675 MHz Band

Nationwide licenses remain the best mechanism for ensuring the rapid and lasting deployment of innovative services in the 1670-1675 MHz band.[10] As ArrayComm, InsideTrax and AeroAstro have explained,[11] here and in the Commission's earlier reallocation docket,[12] nationwide licenses provide the crucial ubiquitous footprint that attracts capital and gains market share. Moreover, these commenters' intended applications for the band all require a nationwide license, for each proposed service — Internet access and location and monitoring services — needs seamless and contiguous coverage to provide useful service.[13] As John Haring and Jeffrey H. Rohlfs have determined, "regional (or *a fortiori*, local) licenses may have virtually no

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[9] Omnibus Budget Reconciliation Act, H.R. Rep. No. 103-111, 103rd Cong., 1st Sess. at 576, 573 (1993) ("House Report").

[10] *See Reallocation NPRM* ¶¶ 30-35.

[11] ET Docket No. 00-221, Comments of ArrayComm at 50 (March 8, 2001) ("ArrayComm ET 00-221 Comments"), Supplemental Comments of ArrayComm at 406 (July 13, 2001) ("ArrayComm ET 00-221 Supp. Comments"), MicroTrax Comments at 12 (March 8, 2001) ("MicroTrax ET 00-221 Comments").

[12] ET Docket No. 00-221, Comments of AeroAstro, Inc. at 7 (March 8, 2001) ("AeroAstro ET 00-221 Comments").

[13] InsideTrax WT 02-08 Comments at 6. *See also* ArrayComm WT 02-08 Comments at 7; AeroAstro WT 02-08 Comments at 5.

value[.]"[14] For similar reasons, the Commission's proposal to grant licenses in a 5 MHz block is the appropriate scheme for this band.[15]

The Commission should reject the argument posed by the National Telecommunications Cooperative Association ("NTCA") that grant of all licenses must occur "according to small geographic areas, such as Metropolitan Statistical Areas (MSAs) and Rural Statistical Areas (RSAs)."[16] NTCA submits that this licensing scheme will "put the spectrum into the hands of smaller carriers and hasten the deployment of service to rural America."[17] Citing to Section 309(j) of the Act, NTCA further argues that MSA or RSA licensing follows Congressional mandates to encourage small business participation and development of services to rural areas.[18] NTCA does not provide any relevant market or service analysis for any of the proposed bands; rather, it simply advances a general public policy position favoring rural deployment generically.

Nationwide licensing, however, is better suited than service-area licensing to creating the environment that NTCA purports to foster. First, MSA or RSA licensing will not ensure rural service but will only create a patchwork quilt of wireless services that provide little value to rural Americans. A carrier with a nationwide license is actually more apt to reach rural areas, because rural deployment is crucial to achieving a contiguous service footprint. This footprint is necessary to the value, and viability, of the services proposed for this band – Internet access and location services. Indeed, ArrayComm's proposed service plan already includes a rural

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[14] John Haring and Jeffrey H. Rohlfs, *Economic Need for a National License in the 1670-1675 MHz Band* at 2 (Feb. 16, 2001), attached to ArrayComm ET 00-221 Comments as Appendix A.

[15] ArrayComm WT 02-08 Comments at 7-8; InsideTrax WT 02-08 Comments at 6; AeroAstro ET 00-221 Comments at 6.

[16] WT Docket No. 00-221, Comments of the National Telecommunications Cooperative Association at 2 (March 4, 2002) ("NTCA WT 02-08 Comments").

[17] NTCA WT 02-08 Comments at 2.

[18] NTCA WT 02-08 Comments at 3.

component. Thus, contrary to NTCA's suggestion,[19] national carriers do have an incentive to serve not only urban areas, but rural areas as well.

Secondly, service-area licensing is not the only mechanism by which the Commission can encourage rural and small business participation. The Commission's proposed small business credits provide ample support to new entrants and small concerns that seek to win the 1670-1675 MHz band license.[20] These credits would be a valuable tool for NTCA's members – rural incumbent local exchange carriers – should they choose to bid for the 1670-1675 MHz license.

Third, only with nationwide licensing will this spectrum receive a market valuation sufficient to attract capital for the forthcoming auction and to finance the rapid buildout of facilities. Unless potential licensees can demonstrate to investors that their proposed service is robust and ubiquitous, they may be unable to obtain financing to participate in the auction, much less build out facilities. To discourage the capital markets in this way disadvantages urban and rural America alike.

Finally, NTCA has not provided the Commission with a single company or service that it reasonably believes will compete for this spectrum. ArrayComm, InsideTrax and AeroAstro, by contrast, have demonstrated a direct need for this spectrum and provided detailed descriptions of the services they wish to provide.[21] These companies have thus provided the better assurance to the Commission that the 1670-1675 MHz band will be used to its maximum benefit.

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[19] NTCA WT 02-08 Comments at 2.

[20] *See* Section V.B, *infra*. *See also* ArrayComm WT 02-08 Comments at 35-37.

[21] ArrayComm WT 02-08 Comments at 2 (discussing its *i-BURST*™ wireless Internet service); InsideTrax ET 00-221 Comments at 18 (describing its proposed Personal Location and Monitoring Service (PLMS); AeroAstro WT 02-08 Comments at 3-4 (describing its proposed Satellite Enabled Notification Service (SENS)).

The Commission indicated in the *Reallocation NPRM* that nationwide licensing is the more viable scheme for use of the 1670-1675 MHz band.[22] This position is well supported in this proceeding.[23] Although NTCA is correct that the Commission is required to consider the impact of licensing on rural America,[24] Congress made it clear that its chief goal in authorizing spectrum reallocation and competitive bidding was to achieve the most efficient and valuable possible uses for all spectrum.[25] In addition, the generous bidding credits that the Commission will provide for small entities[26] will themselves provide both the means and the incentive for rural carriers to apply for this spectrum. The Commission therefore should adopt its tentative conclusion and grant a nationwide license in the 1670-1675 MHz band, allocated in the full 5 MHz block.

C. No Commenter Supports Creating Band Managers for the 1670-1675 MHz Band

The Commission's question whether band managers are appropriate for the 1670-1675 MHz band[27] received no positive response. Both ArrayComm and AeroAstro oppose band managers.[28] Although commenters to other bands in this proceeding support adoption of band

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22 *Reallocation NPRM* ¶ 30.

23 ArrayComm WT 02-08 Comments at 6-7; InsideTrax WT 02-08 Comments at 5. *See also* ArrayComm ET 00-221 Comments at 50; InsideTrax ET 00-221 Comments at 12; AeroAstro ET 00-221 Comments at 7.

24 NTCA WT 02-08 Comments at 3 (citing 47 U.S.C. § 309(j)).

25 House Report at 573.

26 *See Reallocation NPRM* ¶ 146. *See also* ArrayComm WT 02-08 Comments at 37-38; Section VI, *infra*.

27 *Reallocation NPRM* ¶ 40.

28 ArrayComm WT 02-08 Comments at 8-10; AeroAstro Comments at 5. InsideTrax did not comment on this issue.

managers,[29] band managers in the 1670-1675 MHz band are likely to be a hindrance to the efficient use of spectrum.

There is simply no need for a band manager when only one nationwide 5 MHz block license is granted, as the record encourages the Commission to do. And as the Commission has recognized, providing licenses through a band manager scheme can result in harmful interference, loss of spectrum efficiency, and degradation of service.[30] In addition, the authorization of band managers can inhibit financing of service providers, because investors are wary of the fact that the entity in whom they invest does not in fact hold the license.[31] Finally, band managers can hinder service ubiquity, a quality that commenters in this band have repeatedly stated is crucial for service viability.[32] As such, authorization of band managers for the 1670-1675 MHz band is patently not in the public interest and would thwart, rather than further, Congress's express goals for reallocated spectrum.

II. Nothing in the Record Militates Against Adoption of the Proposed Application, Ownership and License Term Rules for the 1670-1675 MHz Band

The Commission should feel confident in adopting its proposed regime of flexible rules to govern the application, use and operational review of services in the 1670-1675 MHz band. The few parties providing comment on the Commission's proposed rules for this band either wholly support the proposed rules or, as in the case of AeroAstro's requested 20-year license

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[29] WT Docket No. 02-08, Comments of American Petroleum Institute at 7 (1390-1395 MHz, 1427-1432 MHz, and 1432-1435 MHz bands only) (March 4, 2002); Comments of the American Mobile Telecommunications Association, Inc. at 3-4 (1392-1395 MHz and 1432-1435 MHz bands only) (March 4, 2002).

[30] *Implementation of Sections 309(j) and 337 of the Communications Act of 1934, As Amended*, WT Docket No. 99-87, Report and Order and Further Notice of Proposed Rulemaking, FCC 00-403, 15 FCC Rcd. 22709, 22728 (2000).

[31] ArrayComm WT 02-08 Comments at 9.

[32] ArrayComm WT 02-08 Comments at 6-7, 9; InsideTrax WT 02-08 Comments at 6-7; ArrayComm ET 00-221 Comments at 50-51; MicroTrax ET 00-221 Comments at 12; AeroAstro ET 00-221 Comments at 7.

term, provide no significant reason to depart from the proposals. The record thus demonstrates that the Commission's tentative approach is reasonable, sound, and in keeping with Congress's goals for the public radio spectrum.

A. Flexible Use and Eligibility Rules Remain Appropriate for the 1670-1675 MHz Band

No commenter disagrees[33] that the Commission should permit prospective licensees in the 1670-1675 MHz band to provide either commercial mobile radio service ("CMRS"), private mobile radio service ("PMRS"), or both.[34] As ArrayComm has stated, and will not belabor the point here, this approach will obviate the risk that a licensee is "restricted by an artificial distinction in its initial license application," thus enabling licensees to respond quickly to changes in consumer demand.[35]

Similarly, the Commission's proposal to limit applicant eligibility only in accordance with the foreign ownership restrictions in Section 310 of the Act, 47 U.S.C. § 310, casts an appropriately wide net for potential auction participants.[36] By permitting such broad participation, the Commission will ensure that the 1670-1675 MHz band experiences vigorous competition for licenses. Congress's foreign ownership restrictions provide the proper qualification requirement for applicants in this band, and no further protection is required.[37]

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[33] *See* InsideTrax WT 02-08 Comments at 5-7; AeroAstro WT 02-08 Comments at 4-5.

[34] *See Reallocation NPRM* ¶¶ 78-80.

[35] ArrayComm WT 02-08 Comments at 10-11.

[36] *Reallocation NPRM* ¶¶ 81-83.

[37] *See* ArrayComm WT 02-08 Comments at 12.

The Commission should therefore adopt its tentative approach for license eligibility and spectrum use in order best to ensure that carriers can deploy and provide innovative wireless services as Congress intended.[38]

B. AeroAstro's Proposed Twenty-Year License Term Has No Basis In the Act or In Sound Policy

The Commission should adopt its proposed license term of 10 years,[39] as ArrayComm and InsideTrax have advocated in this proceeding.[40] Ten-year license terms provide a sufficient period in which to build and activate service facilities, yet also ensure that licensees do not "stockpile" spectrum in a manner contrary to the public interest.[41] For this reason, ArrayComm cannot support AeroAstro's call for a 20-year license in the 1670-1675 MHz band.[42]

The Commission invited commenters requesting longer than a 10-year term to "specify a reasonable license term and include a basis for the proposed period."[43] ArrayComm submits that a doubling of the proposed term to 20 years is not reasonable. First, 10 years has become the industry standard for Personal Communications Services ("PCS")[44] and WCS[45] spectrum, which provides some measure of uniformity across the wide sweep of the wireless industry. Adopting an identical term in this band will contribute to that uniformity, which will help existing and

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38 House Report at 576.

39 *Reallocation NPRM* ¶ 86.

40 ArrayComm WT 02-08 Comments at 12-14; InsideTrax WT 02-08 Comments at 5, 7.

41 *See* House Report at 256.

42 AeroAstro WT 02-08 Comments at 6.

43 *Reallocation NPRM* ¶ 86.

44 47 C.F.R. § 24.15.

45 *E.g., Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service ("WCS")*, GN Docket No. 96-228, Report and Order, FCC 97-50, 12 FCC Rcd. 10785, 10840 (1997); *Amendment of Parts 21 and 74 of the Commission's Rules With Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service*, MM Docket No. 94-131, Report and Order, 10 FCC Rcd. 9589, 9614 (1995).

potential players in this industry formulate and implement viable business plans. Secondly, a 15-year term seems the outside limit for communications licenses under the Act, and it applies only to satellite earth stations and space stations.[46] Thus, even if AeroAstro's argument is plausible that "funding for spacecraft construction and launch commitment" requires long license terms,[47] a 20-year term is still outside the scope of what the Commission has deemed reasonable.

Finally, AeroAstro's proposed 20-year term is simply too long to permit meaningful Commission oversight of spectrum use. Congress has commanded the Commission to "prevent stockpiling or warehousing of spectrum by licensees or permittees."[48] To provide such a long license term would essentially preclude the Commission from doing its job. It would place too much discretion at the hands of licensees, and could well rob American consumers of the benefits of innovative services. The Commission should therefore reject AeroAstro's proposed 20-year term and instead adopt its more reasonable proposed term of 10 years.[49]

C. The Commission Should Adopt Geographic Partitioning and Spectrum Disaggregation for the 1670-1675 MHz Band

No commenter opposes the Commission's tentative decision to permit geographic partitioning and spectrum disaggregation in the 1670-1675 MHz band. In fact, no commenter opposes this construct as to any of the spectrum presently under consideration.[50] ArrayComm maintains that permitting partitioning and disaggregation is in the public interest insofar as it will

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[46] *Amendment of the Commission's Space Station Licensing Rules and Policies*, IB Docket No. 02-34, Notice of Proposed Rulemaking and First Report and Order, FCC 02-45 ¶¶ 141, 142 (rel. Feb. 28, 2002).

[47] AeroAstro WT 02-08 Comments at 6.

[48] House Report at 256.

[49] The Commission should also reject AeroAstro's proposal to modify the "substantial service test" for operations review, as is discussed in Section III., *infra*.

[50] *See* WT Docket No. 02-08, Comments of Data Flow Systems, Inc. at 5 (March 4, 2002) (supporting geographic partitioning and spectrum disaggregation for the 216-220 MHz band).

"encourage new and efficient uses of this spectrum (*e.g.*, by assisting in the rapid build-out of a ubiquitous nationwide 1670-1675 MHz *i-BURST* network)."[51] ArrayComm's support of the proposed regime does not, however, diminish its position that nationwide coverage, provided through a nationwide license, is key to the financial viablility of innovative services in 1670-1675 MHz. The Commission should therefore permit partitioning and disaggregation in this band.

D. Forbearance from Title II Regulation for Services in the 1670-1675 MHz Band Remains Appropriate

The Commission should adopt ArrayComm's proposal to forbear from applying Title II regulation to the 1670-1675 MHz band.[52] As the Commission found with respect to broadband PCS and CMRS carriers, the services proposed for this spectrum are nascent and highly competitive, such that traditional regulatory methods for protecting consumers from discriminatory, unreasonable or otherwise unlawful practices are unnecessary.[53] In accordance with Section 10 of the Telecommunications Act of 1996,[54] the Commission "shall forbear" from applying regulation where these circumstances are present.[55]

The market circumstances thus warrant forbearance from application of Sections 203, 204, 205, 211 and 212 of the Act. In addition, however, the nondiscriminatory safeguards of Sections 201 and 202 of the Act are equally unnecessary to protect consumers, because all of the

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[51] ArrayComm WT 02-08 Comments at 14.

[52] ArrayComm WT 02-08 Comments at 15-18. *See also Reallocation NPRM* ¶¶ 89-90.

[53] *Personal Communications Industry Association's Broadband Personal Communications Services Alliance's Petition for Forbearance for Broadband Personal Communications Services*, WT Docket No. 98-100, Memorandum Opinion and Order, FCC 98-134, 13 FCC Rcd. 16857 (1998); *Forbearance from Applying Provisions of the Communications Act to Wireless Telecommunications Carriers*, WT Docket No. 98-100, FCC 00-311, 15 FCC Rcd. 17414 (2000).

[54] Pub. L. No. 104-104, 110 Stat. 56 (1996), codified at 47 U.S.C. § 160 *et seq.* (West 2000).

[55] 47 U.S.C. § 160.

services proposed for this spectrum, which include wireless Internet access and other information services, come within an "increasingly competitive" segment of the market.[56] There is also a significant public safety component to these proposed services,[57] which makes the application of the consumer protection provisions of Sections 201 and 202 largely superfluous. For these reasons, the Commission should adopt full forbearance for these services as ArrayComm has proposed.

III. The Commission Should Adopt the "Substantial Service" Test for Operating Performance In Its Current Form

The "substantial service" test remains the appropriate construct for reviewing operating performance in the 1670-1675 MHz band.[58] This test ensures that public radio spectrum is actually used to provide quality services to the public,[59] in keeping with Congress's goals for authorizing the reallocation and auctioning of spectrum.[60] As ArrayComm has explained, "applying this test ... focuses on the net benefit to consumers,"[61] which will "better ensure that the public derives a direct benefit from the authorized spectrum."[62] For these reasons, the "substantial service" test is more appropriate than the generic "construction requirement" standard for reviewing licensee performance and should be adopted.

The Commission should not, however, amend this test as AeroAstro has requested. AeroAstro contends that, if the Commission rejects the new proposal for 20-year license terms, it

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[56] ArrayComm WT 02-08 Comments at 17.

[57] ArrayComm WT 02-08 Comments at 17; AeroAstro WT 02-08 Comments at 8.

[58] *See Reallocation NPRM* ¶ 94.

[59] The substantial service test requires licensees to provide service "which is sound, favorable, and substantially above a level of mediocre service." *Reallocation NPRM* ¶ 94.

[60] *See* House Report at 246.

[61] ArrayComm WT 02-08 Comments at 18.

[62] *Id.* at 18.

should "adopt a renewal standard requiring 'substantial progress toward providing service.'"[63] This test is toothless. AeroAstro's proposed test appears to be a hybrid of the "substantial service" and the "construction requirement" tests, yet it fails to adequately implement either test. Nowhere does it require that actual service be provided, nor does it attempt to impose any quantifiable network buildout requirement. It is a new standard, unsupported by Commission policy, that provides no assurance whatever that the 1670-1675 MHz band would be utilized to any degree, let alone to its maximum efficiency. The Commission should reject this proposal outright, and instead adopt the far more reliable "substantial service" standard traditionally applied to license review.

IV. Technical Rules for the 1670-1675 MHz Band Must Be Unambiguous In Order to Afford Adequate Protection to Government Operations and to Maximize the Commercial Value of the Band

Comments to technical issues raised in the *Reallocation NPRM* on the 1670-1675 MHz band focused primarily on two issues: protection of adjacent band radiosonde and radioastronomy operations, and rules for in-band and out-of-band emissions.

From the outset of this proceeding, ArrayComm has steadfastly supported the establishment of meaningful protection criteria for radiosonde and radioastronomy operations.[64] We continue to do so here. ArrayComm has also expressed its view that the guiding technical regulatory principles should be as follows. First, that in-band emissions limits should be set in consideration of license boundary coordination requirements and RF safety. Second, that general out-of-band emissions limits should be set to promote good engineering practice consistent with other allocations such as PCS and WCS. Third, that protection requirements for systems with exceptional susceptibility to interference — such as radiosonde and radioastronomy systems —

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[63] AeroAstro WT 02-08 Comments at 7.

should apply only in the immediate vicinity of those sites identified by the Commission as requiring protection.[65] This approach guarantees the protection that the Commission seeks for adjacent band services. At the same time, it does not needlessly limit licensees' in-band prerogatives.

The alternative approach, one that attempts to indirectly control the out-of-band behavior of a licensee's equipment through regulation of its in-band behavior, relying on preconceived notions of the relationship between its in-band and out-of-band behaviors, serves no one. The approach does not guarantee protection for adjacent band services. Moreover, in the present case, it places severe, nationwide commercial and technical constraints on licensees[66] in the interests of protecting operations that are either in extremely remote locations, as in the case of radioastronomy,[67] or that account for a tiny fraction of a licensee's coverage area, as in the case of radiosondes.[68]

A. Protection of Radiosonde and Radioastronomy Operations

Meaningful protection for radiosonde and radioastronomy operations requires that commercial systems in the 1670-1675 MHz band be prevented from operating in the immediate vicinity of protected sites.[69] This requires that the locations of the protected sites be known and that coordination procedures be established. ArrayComm has made specific proposals for both radiosonde and radioastronomy operations in this respect.[70]

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64 ArrayComm ET 00-221 Comments at ii.

65 ArrayComm WT 02-08 Comments at 20.

66 ArrayComm WT 02-08 Comments at 24-25, 27.

67 47 C.F.R. § 2.106 n.US311.

68 ArrayComm ET 00-221 Comments, Appendix D.

69 ArrayComm WT 02-08 Comments at 27, 30.

70 ArrayComm WT 02-08 Comments at 27, 31.

In its comments, the National Academy of Sciences ("NAS") supports ArrayComm's proposal that the list of protected radioastronomy sites be based on footnote US311[71] and also ArrayComm's proposal that the threshold levels for interference be those of ITU Recommendation ITU-R RA.769.1.[72]

NAS' comments also support the conclusion that commercial systems must be prevented from operating in the immediate vicinity of protected radioastronomy sites. NAS provides an example of acceptable emissions levels at a 10 km range from a protected radioastronomy site,[73] and goes on to point out that these levels are more than 60 dB below those proposed by AeroAstro.[74] Providing an incremental 60 dB of suppression for emissions into an immediately adjacent band is completely impractical for the types of low-cost portable devices envisioned for any of the proposed applications for the 1670-1675 MHz band. Even if it were practical, according to the NAS example the device would still fail to provide adequate protection if it were within 10 km of a protected radioastronomy site. Commercial systems must be prevented from operating in the immediate vicinity of protected radioastronomy sites.[75]

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71 NAS WT 02-08 Comments at 5; ArrayComm WT 02-08 Comments at 29.

72 NAS WT 02-08 Comments at 4; ArrayComm ET 00-221 Reply Comments, Appendix, XX.19(1)(d)(ii). There seems to be an error in the cited NAS comments. ITU-R RA.769.1 specifies separate power flux spectral density interference limits for VLBI and non-VLBI measurements, –251 dBW/Hz/m^2 and –208 dBW/Hz/m^2, respectively from tables 3 and 4 of RA.769.1. The equipment described in footnote US311 to the spectrum table encompasses both types of systems, and since their sensitivities to interference differ by more than 40 dB, it is important to apply the appropriate protection criterion to each type of site. The NAS comments use a single figure of –255 dBW/Hz/m^2 with regard to the protection of radioastronomy measurements in the 1660-1670 MHz band that does not comport with the cited ITU recommendation.

73 NAS WT 02-08 Comments at 4.

74 NAS WT 02-08 Comments at 5 n.4.

75 We believe that NAS's example is overly pessimistic in that it assumes a square-law path loss — a loss exponent of 3.5 is probably more appropriate — and employs AeroAstro's general out-of-band specification which is actually much less stringent than those proposed by ArrayComm or InsideTrax (ArrayComm WT 02-08 Comments at 26). We clarify the relationships between the various proposals for general out-of-band emissions limits later in

NAS also points out that "protection of RAS [radio-astronomy] observations in the 1.4 GHz and 1.6 GHz bands can be accomplished through the use of exclusion and coordination zones ... for fixed and mobile services,"[76] and goes on to propose "coordination between the mobile service and the radio astronomy [service] and protection of the RAS observations via power flux density limits[.]"[77] ArrayComm strongly supports this approach to coordinating commercial operations in the 1670-1675 MHz band with adjacent-band radioastronomy operations, and has made specific proposals in that regard elsewhere in the record.[78]

The difference between the protection of radiosonde receiver sites and radioastronomy sites is largely one of degree. Radiosonde receivers are less sensitive than radioastronomy receivers, but still far more sensitive than most commercial equipment.[79] The conclusion that commercial systems must be prevented from operating in the immediate vicinity of protected radiosonde receivers still holds — albeit over a smaller area than for radioastronomy — as does the associated requirement that the protected sites and their protection requirements are known well in advance by the 1670-1675 MHz licensee.

With the exception of ArrayComm's[80] and NAS'[81] comments, the comments regarding protection criteria for radiosonde and radioastronomy operations from commercial operations in

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this document. Nonetheless, the general conclusion that commercial systems cannot operate in the immediate vicinities of protected radiosonde and radioastronomy sites continues to hold.

76 NAS WT 02-08 Comments at 5.

77 NAS WT 02-08 Comments at 6. While this statement was made in the particular context of high-powered mobile operations at 1350-1400 MHz, it is equally applicable here.

78 ArrayComm ET 00-221 Comments at 28; ArrayComm ET 00-221 Reply Comments, Appendix, XX.19(d)(1).

79 ArrayComm WT 02-08 Comments at 29-30.

80 ArrayComm WT 02-08 Comments at 23-33; ArrayComm ET 00-221 Comments at 23-48 and Appendices C and D thereto.

81 NAS WT 02-08 Comments at 4-6.

the 1670-1675 MHz band in Dockets ET 00-221 and WT 02-08 provide conjecture rather than analysis. Commenters have proposed general out-of-band emissions limits stating, *e.g.*, that their proposal "offers the best protection to neighboring bands[,]"[82] or that while they have "not been able to examine some of the proposed technical standards in enough detail ... [they] reassert the viability of [their] own scheme."[83]

Regardless of what one would prefer the answer to be, careful analysis leads to ArrayComm's and NAS's conclusions. Radiosonde and radioastronomy sites that are to be afforded protection must be unambiguously identified, and well-defined coordination processes and criteria must be established. ArrayComm remains concerned that these steps have not yet been undertaken and urges the Commission to take the opportunity to do so at this time.

B. In-Band Emissions Limits, Permitted Operations and Cellular Architectures

As stated above, ArrayComm's position is that in-band emissions requirements should not be specified in an attempt to indirectly control out-of-band emissions behavior. Rather, out-of-band behavior should be specified to provide meaningful protection for designated adjacent-band services, while in-band behavior should be specified in consideration of RF safety issues and boundary coordination issues only.

From a technical perspective, in-band and out-of-band emissions levels are certainly interrelated. But the degree and nature of that interrelationship is so dependent on the particular technology in question, the way in which it is operated, and the commercial objectives of that operation, that the licensee is the only party situated to determine how best to conduct in-band operations while satisfying out-of-band obligations and commercial imperatives. If that determination is instead made by some third party, without full knowledge of the economic and

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[82] AeroAstro WT 02-08 Comments at 8.

technical characteristics of the commercial operation, the range of permitted services and the commercial value of the spectrum will be needlessly limited without improving, or perhaps even affording, protection to adjacent band services.

For example, there are proposals in the record that in-band power or antenna heights be limited to protect services operating in adjacent bands,[84] the apparent implication being that base stations (or fixed stations) will necessarily generate more interference to adjacent-band services than mobile (or portable) devices.[85] However, this line of thinking ignores the economic and technical realities of commercial radio equipment. In comparison to mobile devices, base station equipment has far fewer constraints with regard to form factors, costs, and antenna patterns. Even though a base station's in-band emissions would generally be higher than that of a mobile device, its out-of-band emissions — especially in the direction of some protected site — could be far less. Base stations can employ significantly more selective filters than mobiles due to the relative lack of form factor and cost constraints. They can also employ antennas with front-to-back ratios of 15 dB or more, which is impossible for a mobile device.

Similarly, it has been proposed that cellular architectures should perhaps be prohibited in the 1670-1675 MHz band.[86] In certain cases — in the case of systems that follow a "listen before talk" protocol in which mobiles do not transmit unless they can receive a base station signal, for example — a cellular architecture in fact guarantees that protection can be afforded by allowing the locations from which mobiles might transmit to be controlled through base station

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[83] InsideTrax WT 02-08 Comments at 11.

[84] *Reallocation NPRM* ¶ 105. *See also* InsideTrax WT 02-08 Comments at 12.

[85] Base stations generally operate with higher radiated powers and with antennas situated farther above the surrounding terrain than do mobile stations.

[86] *Reallocation NPRM* ¶ 114.

placement. A cellular architecture can therefore prevent the scenario of uncontrollable or autonomous mobile transmissions.

These examples show that limiting a licensee's in-band prerogatives may actually lead to less desirable out-of-band performance. Others exist. We encourage the Commission to specify in-band emissions rules to maximize the commercial utility of the spectrum, and to make the licensee responsible for satisfying its out-of-band obligations. As stated in our comments, ArrayComm continues to support in-band emissions limits of 2 kW EIRP for base stations and 4 W EIRP for mobile equipment.[87]

C. Out-of-Band Emissions Limits

General out-of-band emissions limits should be set to promote good engineering practice, without placing unreasonable technical and economic burdens on the licensee. As described above, a different approach must be taken for the protection of designated radioastronomy and radiosonde operations.

Portions of the record seem to reflect disagreement regarding the general out-of-band limits proposed by the commenters, the interpretation of those limits and their relative stringency. NAS[88] interprets AeroAstro's proposal as the most stringent, and the Commission[89] indicates that ArrayComm's proposal may be the least stringent. AeroAstro states that the "rules should specify an absolute out-of-band limit, rather than an emissions mask tied to in-band power."[90]

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87 ArrayComm WT 02-08 Comments at 22.

88 NAS WT 02-08 Comments at footnote 4.

89 *Reallocation NPRM* ¶ 112.

90 AeroAstro WT 02-08 Comments at 8.

The various proposals can be expressed in identical units for ease of comparison. AeroAstro states its proposal as a power spectral density of –80 dBW/Hz.[91] InsideTrax states its proposal in the general FCC format of an out-of-band emissions reduction of $55+10\log_{10}P$ dB and a measurement bandwidth of 100 kHz,[92] where P is the in-band emissions power in Watts. ArrayComm states its proposal similarly as an out-of-band emissions reduction of $43+10\log_{10}P$ dB and a measurement bandwidth of 500 kHz.[93] The $10\log_{10}P$ term in the InsideTrax and ArrayComm proposals results in emissions masks whose suppression requirements increase in direct proportion to increases of in-band emissions power; similarly, the suppression requirements decrease in direct proportion to decreases of in-band emissions power. The masks therefore specify fixed out-of-band emissions powers that are independent of in-band emissions powers. As a result, they can be treated as power spectral density specifications with the assumption that out-of-band emissions are essentially flat over the measurement bandwidth. The appropriate formula is as follows, taking P = 1 W.

$$\text{PowerSpectralDensity (dBW/Hz)} = -\text{MaskSpecification (dBW)} - 10\log_{10}\text{MeasurementBandwidth (dBHz)}$$

The out-of-band emissions of ArrayComm's *i-BURST*™ system are effectively flat over a 500 kHz bandwidth, and we believe the same to be the case for InsideTrax's proposed system over their proposed measurement bandwidth of 100 kHz. Referencing all systems to a 0 dBi antenna, which would be representative of the mobile devices in each proposed application, and

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[91] AeroAstro WT 02-08 Comments at 8.

[92] InsideTrax WT 02-08 Comments at 12.

[93] ArrayComm ET 00-221 Reply Comments, Appendix at XX.16(a), XX.16(c). The statement of the proposed rule is slightly different in the case of an adaptive antenna, but the radiated peak out-of-band power is comparable in both cases.

employing the expression above, the EIRP power spectral densities corresponding to each proposed general out-of-band limit are as shown in Table 1.

Proposal	EIRP Power Spectral Density (dBW/Hz)
AeroAstro	-80
ArrayComm	-100
InsideTrax	-105

Table 1: Out-of-band emissions specifications

InsideTrax's proposal is the most restrictive, followed by ArrayComm's, and finally by AeroAstro's, which is the least restrictive. We also note that ArrayComm's proposal is consistent with the out-of-band emissions rules for the WCS and Broadband PCS services,[94] and offers nearly the same level of emissions suppression as the most stringent of the three proposals: that of InsideTrax. We have shown here and in our earlier filings that this type of out-of-band emissions rule, while necessary, is not the appropriate mechanism for protecting the uniquely sensitive services operating in the bands adjacent to 1670-1675 MHz; it does, we agree, serve to promote good general engineering practice. In the interest of consistency with other sections of the Commission's rules, we therefore support the Commission's proposal to adopt ArrayComm's specification for a general out-of-band emissions rule.[95]

[94] 47 C.F.R. §§ 27.53, 24.238.

[95] *Reallocation NRPM* ¶ 112.

V. The Commission Should Include a Public Safety Bidding Credit In Addition to the Proposed Small Business Credits Only If Modified To Include All Carriers Serving a Public Purpose

ArrayComm renews its objection to the proposed public safety bidding credit that would apply in addition to the Commission's tentative two-tiered small business credits structure.[96] As proposed by InsideTrax, this credit would apply to a carrier whose proposed use – though devised as a commercial, for-profit operation – has some public safety benefit.[97] Although it purports to "enhance" the Commission's competitive bidding system by "tempering" it with a public interest angle,[98] InsideTrax has put forth a request to be given essentially public service status while planning a commercial enterprise. Further, InsideTrax invokes a far-reaching interpretation of "public safety" that would even include the "safety" of airmail packages.[99] ArrayComm questions whether this concept comports with congressional and Commission spectrum policy in the first instance.

In addition, ArrayComm maintains that, as a practical matter, this credit is likely to prejudice auction participants unwarrantedly and is moreover unnecessary to encourage use of this spectrum for a public purpose, as ArrayComm's and InsideTrax's proposed service plans have demonstrated.[100] And as a matter of law, it is unclear whether seeking bidding credits for a service that is not subject to competitive bidding comports with settled agency rules[101] or congressional intent.[102]

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96 *See Reallocation NPRM* ¶¶ 151-152.

97 InsideTrax WT 02-08 Comments at 7-9.

98 InsideTrax WT 02-08 Comments at 8.

99 InsideTrax WT 02-08 Comments at 9 & n.17.

100 ArrayComm WT 02-08 Comments at 37-38.

101 47 C.F.R. § 1.2101(b) (providing that public safety spectrum shall not be put to auction).

102 *See* 47 U.S.C. § 309(j)(2) (licenses that are likely to result in compensation from subscribers shall be set for auction).

Should the Commission nonetheless determine, despite the foregoing concerns, that a public safety bidding credit is appropriate, ArrayComm urges it to adopt the bidding credit in a more expansive manner than InsideTrax has proposed. That is, the Commission should adopt an eligibility standard that would apply the credit on a uniform basis to any carrier that can demonstrate a public safety application for its service. All such carriers must receive identical credits. To adopt a credit that applies unevenly among carriers would only exacerbate the prejudice that ArrayComm warned of with respect to the initial public safety credit proposal. If, however, the Commission provides a uniform credit available to any carrier with a proposed public safety service, whether as an exclusive or an ancillary use, it would ensure a level playing field for all participants.

VI. Conclusion

The 1670-1675 MHz band presents unique opportunities for the Commission to enable the deployment of innovative services for the public and to demonstrate that commercial operations can coexist with critical government operations. Today's wireless landscape is increasingly characterized by commoditized, undifferentiated services. New services and the technologies that enable them will provide the public with increased choice and with capabilities never before available to them.

The wireless landscape is also characterized by an ever-shrinking pool of fallow or underutilized spectrum, and, at the same time, increased demand for additional spectrum from all quarters. We believe that this 5 MHz of spectrum, seemingly compromised by its small size and protection requirements for government operations, can be made commercially valuable through judicious regulation and thereby serve as a benchmark for future allocations. If so, future challenges faced by the Commission in spectral allocation may be abated, if only slightly.

We applaud the speed with which the Commission has allocated this spectrum and proposed service rules to govern its licensing and use. We encourage it to maintain its pace. We urge the Commission to create rules for the band that are fair, safe, precise, and likely to ensure meaningful protection to appropriate government operations while minimizing risk and uncertainty for potential licensees. These rules should codify the fundamental imperatives for the band, but leave leeway for industry to innovate in meeting those mandates. Finally, these rules should be determined and settled well prior to the auction, in order that potential applicants may plan their participation, and their future services, appropriately.

Respectfully submitted,

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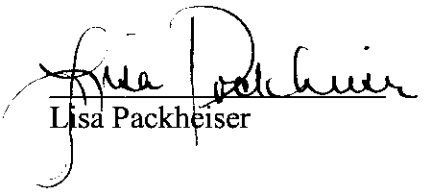
March 18, 2002

CERTIFICATE OF SERVICE

I, Lisa Packheiser, certify that on this 18th day of March, 2002, a true and correct copy of the foregoing Reply Comments of ArrayComm, Inc. were served via courier* or First Class Mail on the following persons:



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